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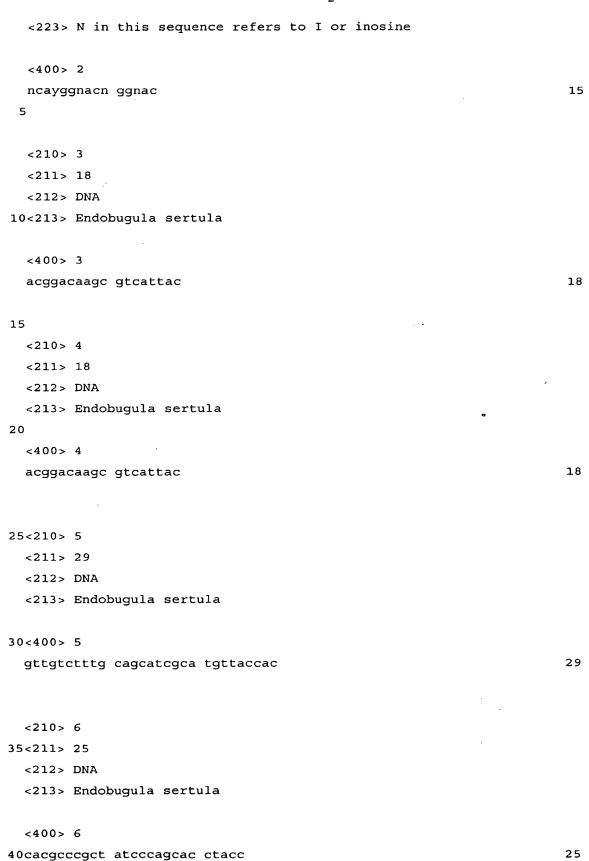
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and Methods

<130> 1183.010WO1

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<151> 1999-08-04
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20<210> 1
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25<220>
<221> misc_feature
<222> (1)..(17)
<223> N in this sequence refers to I or insosine

30<400> 1
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<210> 2
35<211> 15
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<220>
40<221> misc_feature
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<223> N in this sequence refers to I or inosine

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<210> 3

<211> 18

<212> DNA

<213> Endobugula sertula

<400> 3

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<210> 4

<211> 18

<212> DNA

<213> Endobugula sertula

<400> 4

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<210> 5

<211> 29

<212> DNA

<213> Endobugula sertula

<400> 5

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<210> 6

<211> 25

<212> DNA

<213> Endobugula sertula

<400> 6

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<210> 7
<211> 22
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5<213> Endobugula sertula

<400> 7
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<400> 8
catcgctgct tcgcaaccc   19

20<210> 9
<211> 315
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25<400> 9
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aagcgtcatt actgtgctct ggggtcggta aaaagtaata ttggtcattt gggggtaggt 120
gctgggatag cgggcgtgac caaagtattg ttgtctttgc agcatcgcat gttaccaccg 180
acgattcatt gtgaggatgt aaacccacag attgcgttgg aaggtagccc cttttatatc 240
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tcttttggtg tcagt   315

<210> 10
35<211> 105
<212> PRT
<213> Endobugula sertula

<400> 10
40Lys Leu Gly Asp Pro Ile Glu Val Glu Thr Leu Ala Glu Ser Phe Arg

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        1                 5                 10                15

      Val Tyr Thr Asp Lys Arg His Tyr Cys Ala Leu Gly Ser Val Lys Ser
                    20                  25                  30
    5
      Asn Ile Gly His Leu Gly Val Gly Ala Gly Ile Ala Gly Val Thr Lys
                  35                  40                  45

      Val Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys
   10      50                  55                  60

      Glu Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile
          65                  70                  75                  80

   15Asn Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Gly Ile Pro Arg Arg
                      85                  90                  95

      Ala Gly Val Ser Ser Phe Gly Val Ser
                  100                 105
   20
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<210> 11
<211> 736
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25<213> Endobugula sertula

<400> 11
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30gctgggatag cgggcgtgac caaagtattg ttgtctttgc agcatcgcat gttaccaccg 180
acgattcatt gtgaggatgt aaacccacag attgcgttgg aaggtagccc cttttatatc 240
aatacggaat taaagccttg gcagtctggt gacggtatac cacgacgggc tggtgtcagt 300
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35gcaaaaaatg atgaatgctt aaatgcttgt gtcgaacgac tgttattttt tctaaaaagc 480
aggcaatccg atacatataa aaaatattcc ttaagtgata cagctcctat attgttagat 540
ttagcatata ccctccaggt cagtagggaa gcgatgacaa aacgagttgc ctttgtagtg 600
aaaacaacaa tagagttaat ggaaaaatta aatgcattta tagaaaaaca aaatactata 660
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<210> 12
<211> 245
<212> PRT
5<213> Endobugula sertula

<400> 12

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                20                  25                  30

Asn Ile Gly His Leu Gly Val Gly Ala Gly Ile Ala Gly Val Thr Lys
15          35                  40                  45

Val Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys
        50                  55                  60

20Glu Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile
    65                  70                  75                  80

Asn Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Gly Ile Pro Arg Arg
                85                  90                  95
25

Ala Gly Val Ser Ser Phe Gly Val Ser Gly Thr Asn Ala His Leu Val
            100                 105                 110

Leu Glu Glu Tyr Thr His Arg Val Thr Ser Pro Leu Gln Asn Thr Ile
30          115                 120                 125

Leu Pro Gln Asn Gly Leu Phe Ile Val Pro Leu Ser Ala Lys Asn Asp
        130                 135                 140

35Glu Cys Leu Asn Ala Cys Val Glu Arg Leu Leu Phe Phe Leu Lys Ser
    145                 150                 155                 160

Arg Gln Ser Asp Thr Tyr Lys Lys Tyr Ser Leu Ser Asp Thr Ala Pro
                165                 170                 175
40
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6

Ile Leu Leu Asp Leu Ala Tyr Thr Leu Gln Val Ser Arg Glu Ala Met
            180   185   190

Thr Lys Arg Val Ala Phe Val Val Lys Thr Thr Ile Glu Leu Met Glu
5   195   200   205

Lys Leu Asn Ala Phe Ile Glu Lys Gln Asn Thr Ile Lys Ala Ser Asn
        210   215   220

10 Ile Lys Gly Cys Tyr Tyr Ser Ser Thr Lys Thr Ser Ser Pro Phe Asp
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Asn Glu Ser Thr Asp
                245
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<210> 13
<211> 312
<212> DNA
20 <213> Endobugula sertula

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25 gctggagtcg ttggtctgat caagacagca ttgtcgctgc agcaccgttt gttgcctccc 180
acgatcaact acgaagcacc caatcgggaa atcaattttg aacaatcacc ctttcatgtg 240
attgatgaac tcacggagtg gcggggtcaa ggtggaccac ttcgtgctgg tgtcagctcg 300
tttggaattg gt 312

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<210> 14
<211> 104
<212> PRT
<213> Endobugula sertula
35
<400> 14
Arg Leu Gly Asp Pro Ile Glu Leu Ala Ala Leu Ser Lys Ala Phe Glu
    1   5   10   15

40 Glu Gly Thr Gln Arg Lys Gln Phe Cys Gly Ile Gly Ser Val Lys Ser

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                 20                      25                      30

     Asn Ile Gly His Leu Asp Val Ala Ala Gly Val Val Gly Leu Ile Lys
             35                      40                      45
 5
     Thr Ala Leu Ser Leu Gln His Arg Leu Leu Pro Pro Thr Ile Asn Tyr
             50                      55                      60

     Glu Ala Pro Asn Arg Glu Ile Asn Phe Glu Gln Ser Pro Phe His Val
10 65                      70                      75                      80

     Ile Asp Glu Leu Thr Glu Trp Arg Gly Gln Gly Gly Pro Leu Arg Ala
                     85                      90                      95

15Gly Val Ser Ser Phe Gly Ile Gly
                    100


    <210> 15
20<211> 324
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    <213> Endobugula sertula

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    tctggtgtgg ctggtataca caaggtgctg ttatcgctta agcatcgaca attagtagcg 180
    agcctgcatt ttaatagcgc caatcaccac tttgattttc aacagtcgcc tttttatgtc 240
    aatacccagc taaggccctg ggatcaagca gagggactag aagaaagccg ccgccgggct 300
30gcggtcagtt cttttggtgt cagt                                        324



    <210> 16
    <211> 108
35<212> PRT
    <213> Endobugula sertula

    <400> 16
    Gln Leu Gly Asp Pro Ile Glu Leu Gln Ala Leu Ala Asp Val Tyr Arg
40 1                   5                      10                      15
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        Val Asp Asn Trp Arg Lys Asn Thr Cys Ala Leu Gly Ser Val Lys Ser
                     20                  25                  30

        Asn Ile Gly His Thr Ser Ala Ala Ser Gly Val Ala Gly Ile His Lys
    5            35                  40                  45

        Val Leu Leu Ser Leu Lys His Arg Gln Leu Val Ala Ser Leu His Phe
             50                  55                  60

    10Asn Ser Ala Asn His His Phe Asp Phe Gln Gln Ser Pro Phe Tyr Val
             65                  70                  75                  80

        Asn Thr Gln Leu Arg Pro Trp Asp Gln Ala Glu Gly Leu Glu Glu Ser
                     85                  90                  95
    15
        Arg Arg Arg Ala Ala Val Ser Ser Phe Gly Val Ser
                     100                 105
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20<210> 17

   <211> 308

   <212> DNA

   <213> Endobugula sertula

25<400> 17

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    cagaaaaatc gtttgctggt cggatcagta aaagccaata ttagtcacct ggaagcagcc 120
    ggggtattt ctggactgat caaagcagta ctggcaatgc agcatggcgt gattccacag 180
    caattacact gcaaagaacc gagtcctcat atccctggа aacgtctgcc tctcgatttg 240
30gtacaagagc agactgtctg gccggaaagt gaagagcgga tcgcggctgt aacagcgtcg 300
    gattagcg                                                        308
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   <210> 18

35<211> 101

   <212> PRT

   <213> Endobugula sertula

   <400> 18

40Glu Tyr Gly Asp Pro Met Glu Leu Thr Ala Ala Ala Ala Val Phe Gly

```
            1                5                10               15

    Arg Gly Arg Asn Gln Lys Asn Arg Leu Leu Val Gly Ser Val Lys Ala
                    20               25               30
 5
    Asn Ile Ser His Leu Glu Ala Ala Gly Gly Ile Ser Gly Leu Ile Lys
                    35               40               45

    Ala Val Leu Ala Met Gln His Gly Val Ile Pro Gln Gln Leu His Cys
10      50               55               60

    Lys Glu Pro Ser Pro His Ile Pro Trp Lys Arg Leu Pro Leu Asp Leu
        65               70               75               80

15Val Gln Glu Gln Thr Val Trp Pro Glu Ser Glu Glu Arg Ile Ala Ala
                    85               90               95

    Val Thr Ala Ser Asp
                    100
20
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    <210> 19
    <211> 300
    <212> DNA
25<213> Endobugula sertula

    <400> 19
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    acgacatacc ttggtgctgt aaaaagcaac ataggtcatg ccaacgcagg agcgggcatt 120
30gctggtttta ttaaaacggt gctgtctctt taccatggca aaattgcacc caatgcaggc 180
    aataccgagc ccaatgcagc tttgaacctt gacgcgtttc attttgcatt accaaaaact 240
    ttgcttacat ggccggagtg tgatgttcga cgggcagcga tcagctcact gggttttggt 300


35<210> 20
    <211> 100
    <212> PRT
    <213> Endobugula sertula

40<400> 20
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    Gln Leu Gly Asp Glu Ile Glu Val Arg Ala Leu Ser Lys Val Tyr Gly
     1               5                   10                  15

    Asp Ser Gln Ser Thr Thr Tyr Leu Gly Ala Val Lys Ser Asn Ile Gly
 5               20                  25                  30

    His Ala Asn Ala Gly Ala Gly Ile Ala Gly Phe Ile Lys Thr Val Leu
                 35                  40                  45

 10Ser Leu Tyr His Gly Lys Ile Ala Pro Asn Ala Gly Asn Thr Glu Pro
                 50                  55                  60

    Asn Ala Ala Leu Asn Leu Asp Ala Phe His Phe Ala Leu Pro Lys Thr
         65                  70                  75                  80
 15
    Leu Leu Thr Trp Pro Glu Cys Asp Val Arg Arg Ala Ala Ile Ser Ser
                         85                  90                  95

    Leu Gly Phe Gly
 20                 100
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    <210> 21
    <211> 304
 25<212> DNA
    <213> Endobugula sertula

    <400> 21
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 30tctccgctgg tgctcggtgc acttaaatcg aacatcgggc atttggaagc gactgcaggt 120
    gttgcagctc tgattaaggc agttttggtt cttcaacatg gcgtggctcc ggccaatttg 180
    cactgtcaca aattgaatcc gcttctggat atcgacggct caatgttgt gttcccgcag 240
    tctgagaccc ccttgcacag ctctctgcag ctacttggcg ggtatcagtt cgttcgggtt 300
    tggt   304
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    <210> 22
    <211> 101
    <212> PRT
 40<213> Endobugula sertula

<400> 22

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    Ala Leu Gly Asp Pro Ile Glu Phe Gly Ala Ile Lys Ala Val Tyr Gly
    1               5                   10                  15

 5Pro Gly Arg Ser Ser Pro Leu Val Leu Gly Ala Leu Lys Ser Asn Ile
                    20                  25                  30

    Gly His Leu Glu Ala Thr Ala Gly Val Ala Ala Leu Ile Lys Ala Val
                35                  40                  45
10
    Leu Val Leu Gln His Gly Val Ala Pro Ala Asn Leu His Cys His Lys
        50                  55                  60

    Leu Asn Pro Leu Leu Asp Ile Asp Gly Phe Asn Val Val Phe Pro Gln
15 65               70                  75                  80

    Ser Glu Thr Pro Leu His Ser Ser Leu Gln Leu Leu Gly Gly Tyr Gln
                    85                  90                  95

20Phe Val Arg Val Trp
                100
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<210> 23
<211> 314
<212> DNA
<213> Endobugula sertula

<400> 23

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   gccggagtat ctggagtagt caaagtgtta ctcgctttga aacataagca acttccacct 180
   tcctgtcatc tggtgaaaat caatgagcat atcaaccttg aggacagtcc attttatatc 240
   aatacggcat taaagaaatg ggaagtatcg gaaggtgagg ctcgcagggc cgcagtcagc 300
35tcgtttggtt cagc                                                     314
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<210> 24
<211> 103
40<212> PRT

<213> Endobugula sertula

<400> 24

Thr Trp Xaa Ser Leu Leu Arg Trp Gly Leu Leu Gln Asn His Phe Asp
5 1   5   10   15

Pro Tyr Thr Glu Lys Lys Asn Tyr Cys Ala Ser Gly Ser Val Lys Ser
            20   25   30

10Asn Ile Gly His Leu Thr Ala Ala Gly Val Ser Gly Val Val Lys Val
            35   40   45

Leu Leu Ala Leu Lys His Lys Gln Leu Pro Pro Ser Cys His Leu Val
        50   55   60
15

Lys Ile Asn Glu His Ile Asn Leu Glu Asp Ser Pro Phe Tyr Ile Asn
    65   70   75   80

Thr Ala Leu Lys Lys Trp Glu Val Ser Glu Gly Glu Ala Arg Arg Ala
20   85   90   95

Ala Val Ser Ser Phe Gly Ser
                100

25
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   <211> 306
   <212> DNA
   <213> Endobugula sertula
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   aaatactgtg cgatagggtc ggtgaagagc aacattggtc atgccgatac ggcggctggc 120
   gtcgctggtc tcatcaagac ggtgatggca ctcaaggcgc gtcagatacc gcctagcttg 180
35cactttgaga ccccccaatcc gcagatcgat tttgccgaca gtccctttta tgtaaataca 240
   accttgaaag attggaacac caacggtgtt ccgcgccgcg cgggcgtgag ttcgtttggc 300
   atcggt   306

40<210> 26

<211> 102
<212> PRT
<213> Endobugula sertula

5<400> 26

Pro Leu Gly Asp Pro Ile Glu Met Ala Ala Leu Lys Gln Ala Phe Gly
1   5   10   15

Thr Gln Lys Lys Lys Tyr Cys Ala Ile Gly Ser Val Lys Ser Asn Ile
10   20   25   30

Gly His Ala Asp Thr Ala Ala Gly Val Ala Gly Leu Ile Lys Thr Val
        35   40   45

15Met Ala Leu Lys Ala Arg Gln Ile Pro Pro Ser Leu His Phe Glu Thr
        50   55   60

Pro Asn Pro Gln Ile Asp Phe Ala Asp Ser Pro Phe Tyr Val Asn Thr
    65   70   75   80

20
Thr Leu Lys Asp Trp Asn Thr Asn Gly Val Pro Arg Arg Ala Gly Val
                85   90   95

Ser Ser Phe Gly Ile Gly
25   100

<210> 27
<211> 309
30<212> DNA
<213> Endobugula sertula

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gctggcattg ctggacttct caagatcgtc atggcgatga agcatcgtca actgccgccg 180
agcttgaatt ttgaaacacc aaatccagac ctggatctgg agaatagtcc gttcttcatc 240
cagacgaagc tgaaggattg ggaaagtgtg gggcctcgtc gtgccgcgtt gagttcgttt 300
ggtttgggt   309
40

<210> 28

<211> 103

<212> PRT

<213> Endobugula sertula

5

<400> 28

Val Val Gly Asp Pro Ile Glu Val Val Gly Leu Thr Lys Ala Tyr Gln
1   5   10   15

10Ala His Thr Gln Glu Arg Gln Tyr Cys Gly Leu Gly Ser Val Lys Thr
                20   25   30

Asn Ile Gly His Thr Asp Ser Ala Ala Gly Ile Ala Gly Leu Leu Lys
            35   40   45

15

Ile Val Met Ala Met Lys His Arg Gln Leu Pro Pro Ser Leu Asn Phe
        50   55   60

Glu Thr Pro Asn Pro Asp Leu Asp Leu Glu Asn Ser Pro Phe Phe Ile
20 65   70   75   80

Gln Thr Lys Leu Lys Asp Trp Glu Ser Val Gly Pro Arg Arg Ala Ala
                85   90   95

25Leu Ser Ser Phe Gly Leu Gly
                100

<210> 29

30<211> 6000

<212> DNA

<213> Endobugula sertula

<220>

35<221> misc_feature

<222> (386)..(388)

<223> TAG may represent a transposase open reading frame

<220>

40<221> misc_feature

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<222> (444)..(449)

<223> TTGAAA may be a possible -35 trascription control
      sequence


5<220>

<221> misc_feature

<222> (458)..(463)

<223> GATAAT may be a possible -10 trascription control
      sequence

10

<220>

<221> misc_feature

<222> (474)..(502)

<223> ATCAATAAAAA and TTTTTATTGAT are inverted repeats

15

<220>

<221> misc_feature

<222> (576)..(583)

<223> TGAGGAAT may be a possible SD sequence

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<220>

<221> misc_feature

<222> (565)..(567)

<223> ATG encoding M is presumptive start of PKS Open

25    reading frame


<220>

<221> misc_feature

<222> (589)..(591)

30<223> GTG encoding V is is possible alternative start of
        PKS Open reading frame


<400> 29

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35ccagctaatc aacgaacaac aaaagcagca aacgggcaaa ctcatcagag ccttattgca 120
ggtggattgt ttaagtattg atgaactcgg ttatatccca ttccctaaat ccggtggggc 180
gttgctcttc cacctcatca gtaaacggta tgagaagacc agtattatca tcagcaccaa 240
tctggctttt ggggaatgga acagtgtgtt tggtgatgcc aagatgacca ccgcgttatt 300
ggatcgtatc acgcatcatt gttcaatcat cgaaaccaag catgcgtcgt atcgttttaa 360
40gcagagtcag aaacagacat gaaagtagct ttcaccggtg ggacagtgtt agatgcaaac 420
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        aaaataaaat ttttttattg attatgatga tccacgttaa aaaaaatact ataaatatga 540

        aataatattt caactttatt tttgatggtc gttgttgagg aatttttgt gagttatcga 600

        gatattttga aggctttaca ggatgaaaaa attagttttg aagaggctaa atataagtta 660

     5ataaaaagaa aagataaaaa atcaaacag cgtttaaatc atgatcgtga attaaatcga 720

        tcgatgaata ttacgccaaa aatagtgaat aattacggtt tagtattatt gggcggtcat 780

        ttatttgaag aactccgtct gagtgaatgg aaagctgcca accctaaccc taatgaagtt 840

        agcattcagg tcaaggcatc cgccattagt tttaccgata ccttgtgtgt acaaggttta 900

        tatccatcac actatccctt tgttccgggc tttgaagtat cgggagtgat tcgtcaagtg 960

    10ggtgaacaca taaccgactt acacgtgggt gatgaagtta ttgcgttcac aggatcatca 1020

        atgggagggc atgctgccta tgtgacggtg ccacaagatt acgtggtacg aaaacccaag 1080

        gacttatctt ttgaggatgc ctgtagcttc ccattggctt ttgcgaccgt ctatcacagt 1140

        tttgcacggg gaaaattatc tcacaacgat catatcttga tacaaacggc gacaggtggc 1200

        tgtggtttga tggcacttca gttggcgcgt ttaaagcagt gtgtgtgtta tgggacctcc 1260

    15agccgagaag acaagcttgc actcctcaaa cagtgggcac tgccctacgt cttcaattat 1320

        aagacgtgca atattgatga ggagattcaa cgcgtcagtg gtcatcgagg tgtcgatgtc 1380

        gtcttaaata tgctcccagg agagcatata caacaagggc tgaatagttt agccaaggga 1440

        ggccgttatt tggaactgtc gatgcatgga ttgttaacga acgaacctgt cagtctgtcg 1500

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    20gatgatggct ttatcgggtc tgtattagcg caaatggttt cctggattga atcaggtgat 1620

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        gcgacagggg gaaaaagccg ggtgtggggt ggtactggtg tcaatgacaa accgtctcct 1860

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      tatccgaagt cgaagacact ggagcaattt tggcagaccc tagcggatgg agtggattgc 1980

        atctcagaga ttcctgctga tcgctggtcg ttagaagagt attactcgcc aataccggaa 2040

      gggggtaaaa cgtattgtaa gtggatgggt gttttggagg acatggattg ttttgatccg 2100

        ttgttttttg cgatatctcc tcgggaagcg gaagtgatgg acccacagca acggttattt 2160

    30ttagagaatg catggagttg tatagaggat gcggggatta accctaagat gttatcccgt 2220

        agtcgatgtg gggtatttgt tgggtgcggt gcgaatgatt acagcgctct aatgaacagt 2280

        agccactcaa cgagtctcga attaatgaag gaattaggca acaactcttc cattttatct 2340

        gcacgaatct cctacttttt aaatttaaag ggcccttgtc ttgcgattga taccgcatgt 2400

        tcttcttcat tagtggccat tgccgagtcg tgtaatagtc tggtgttggg tactagtgac 2460

    35ttggcgttgg caggtggagt gttgctgatg ccaggtccat ccttacatat aggtttgagt 2520

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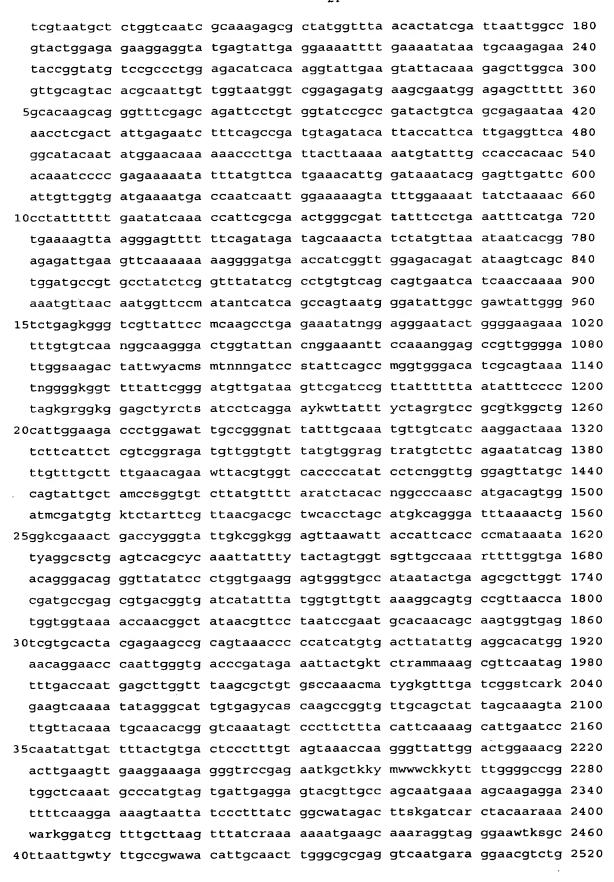
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amygawakac ckarnrtcam csygccaaks gcryagtgmy tggakagsmw gytgwtgcar 5640
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15

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    <213> Endobugula sertula
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    <223> N refers to any nucleotide
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    tcaaagtatt attgtctctg agtggattaa tgaagacctg tctagtaatg nttgaaaatg 3420

    tggtgaaaaa taatcanttg tttnagaaat acaaaatcac tcntgatncc gattactngt 3480

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    ggaagaaaat atttttataa aattttagng gggataaaaa gaaaattatn ggattttttct 3600

    ccntaaacgc ccctttgatt ggagtttatg ggttggattc atattcgaac ctacnttgga 3660

    anttaaagat cattactcgg kragcmttyt tcyataaaac trgaasmtac tttkktmtky 3720

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  <220>

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  <223> N refers to any nucleotide

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  aatcwataca aaaaawattg awagattttt kggtkgacat tactaacttt ttsgaggcna 180

  agacatcmat ccmrgcmgga tgcctggtga ctatggtgkt gattccatta ttaggtatga 240

  gatttyttaa tcgaattaac cyccaccttt aawatagaag ctgatgcttt attactaaca 300

 5gaaggaacga ttmaccagta tatctcataa arkwcmttct tttattgttg ataaaaaaaa 360

  ttacccaatg ttaccaaatt ttggattaga aaatgattct aataaagaaa ataaaggctg 420

  ggtaaagcct tcttttattg aatttattaa atttgaaatc aatcctgaat atatagaaag 480

  cagtacaaaa aataaagatt acgcgattct tgaaaatcta ataaataatg gagttggagt 540

  ttggagagaa aataatcatc tatgttttga gttttttttat gaaactcata caaatgaaac 600

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  tccatataat cttattcaag gatttagagt ggaaatgcca gtcaatattg aaattttaaa 780

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30aaggccnaan tggaattaat tggnaaaatt tccantttgg gtttttaaaa aggggaaaaa 1860

  ncccannaat ttgggtttcc ttaaaaanaa aaaaagggg ggnggccccc cggtgggttc 1920

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<223> N refers to any nucleotide

5<400> 34

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15<212> DNA

<213> Endobugula sertula

<220>

<221> misc_feature

20<222> (1)..(2132)

<223> N refers to any nucleotide

<400> 35

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aacctttccc aaaaaaaggg naanttgaan tggggggnan cntggggaaat cccaagccaa 180

aaaaaggccc aaymtcgccc waraacrkkc cawwaatsss gawaasmcyy ccagawarwa 240

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aarymytcca wyktkttkss grrtcaatka tgssrkwtyy tcaaymttgg gactcmcyym 360

30tcmmmwwttt gaaaaccmyw attatakktr taagsgggcc aaataatcaa tgttggatat 420

ggttaamccg ataaaaaaaa gcctcaataa attttnctgc caacaactaa gacagctcta 480

caataaacat aaaagcaata atgagtccct gtgattattt cccatgaaaa aaacaatggc 540

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tttccggatg caaaaaatgt taatgaattt tgggaaaatt taaaaaatgc tcgtcatagt 660

35gttaaagaaa ttccctataa ccggtcttgg gatattgata attactttga tacttcttcg 720

caaacacatg cacaggaata tgttaaacaa ggagcatttt tagaaaatat cgatcttttt 780

gatccgctgt tttttaatat ttctccggtg gaagcagagc ttatggatcc aactgaacga 840

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    <211> 2169
    <212> DNA
25<213> Endobugula sertula

    <220>
    <221> misc_feature
    <222> (1)..(2169)
30<223> N refers to any nucleotide

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35cccccccactt tggaaaacct tccccnaaaa aaaataaaaa ggcntttgga attttttaac 180
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    gggyctccwr rnaytyyaaw awgramgsgk tawytmccwa ktgrggggwn ttwtatcawt 300
    aaaggnssgg ggktytawkw tttawraarr ggragcttta graawawaaw arwcmgtkgk 360
    ktttaaraga rattkwwaar rraactggrw traaktwwww rwrttatwat anaaatrkkw 420
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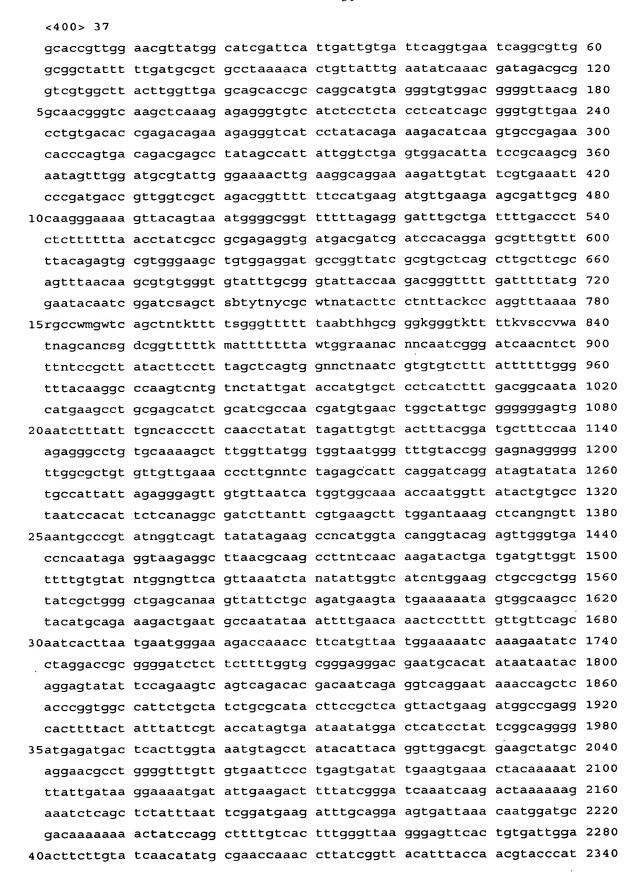
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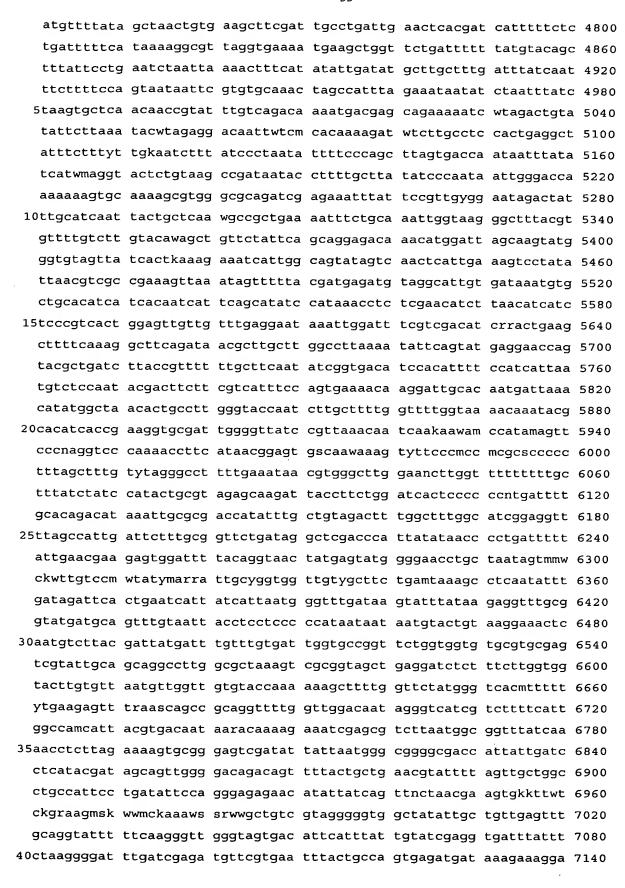   <210> 37
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Gly Leu Val Leu Leu Gly Gly His Leu Phe Glu Glu Leu Arg Leu Ser
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Val Ile Ala Phe Thr Gly Ser Ser Met Gly Gly His Ala Ala Tyr Val
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Glu Asp Ala Cys Ser Phe Pro Leu Ala Phe Ala Thr Val Tyr His Ser
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Phe Ala Arg Gly Lys Leu Ser His Asn Asp His Ile Leu Ile Gln Thr
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38

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    Tyr Thr Asp Lys Arg His Tyr Cys Ala Leu Gly Ser Val Lys Ser Asn
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 20
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    785                 790                 795                 800


    Leu Leu Ser Leu Gln His Arg Met Leu Pro Pro Thr Ile His Cys Glu
 25                 805                 810                 815


    Asp Val Asn Pro Gln Ile Ala Leu Glu Gly Ser Pro Phe Tyr Ile Asn
                    820                 825                 830


30 Thr Glu Leu Lys Pro Trp Gln Ser Gly Asp Ser Ile Pro Arg Arg Ala
                835                 840                 845


    Gly Val Ser Ser Phe Gly Phe Ser Gly Thr Asn Ala His Leu Val Leu
        850                 855                 860

35
    Glu Glu Tyr Leu Pro His Ser Thr Gly Thr Ile Glu Ser Phe Ala Ala
    865                 870                 875                 880


    Asn His Ala Ser Thr Val Ile Ile Pro Leu Ser Ala Lys Ser His Asn
 40                 885                 890                 895
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Ser Leu Tyr Thr Tyr Ala Gln Thr Leu Leu Ile Phe Leu Lys Arg Ser
900   905   910

Gln Val Thr Asp Ala Lys Lys Ile Thr Ile Asp His Met Glu Cys Arg
5   915   920   925

Leu Leu Asp Leu Ala Tyr Thr Leu Gln Val Gly Arg Glu Ala Met Asp
930   935   940

10Lys Arg Ile Ser Phe Ile Val Asn Thr Lys Gln Ala Leu Val Glu Lys
945   950   955   960

Leu Asn Ala Phe Leu Glu Lys Glu Lys Thr Ile Thr Asp Cys Tyr His
965   970   975

15
Tyr Leu Phe Asp Ser Asp Lys Pro Ser Thr Glu Ile Phe Arg Leu Asp
980   985   990

Glu Asp Asp Lys Val Leu Ile Asn Ser Trp Ile Ser Gln Ser Gln Tyr
20   995   1000   1005

His Lys Leu Ala Glu Ala Trp Ser Gln Gly Leu Asp Ile Asp Trp Thr
1010   1015   1020

25Leu Leu Tyr Thr His Ser Ser Thr Pro Arg Arg Ile Ser Leu Pro Thr
1025   1030   1035   1040

Tyr Pro Phe Ala Arg Asp Arg Tyr Trp Leu Pro Glu Lys Pro Arg Tyr
1045   1050   1055

30
Asn Ala Ala Asn His Pro Val Ser Asn His Gln Thr Thr Thr Gln Asn
1060   1065   1070

His Ser Arg Phe Ala Ile Asp Thr Asp His Asp Val Val Ala Glu Ile
35   1075   1080   1085

Met Gln Lys Thr His Gln Gln Glu Leu Glu Gln Trp Leu Leu Lys Leu
1090   1095   1100

40Leu Phe Val Gln Leu Gln His Met Gly Leu Phe Gln His Arg Val Phe

1105   1110   1115   1120

Glu Thr Ala Thr Ala Leu Arg Gln Ser Ala Gly Ile Val Asp Lys Tyr
                1125   1130   1135
5
Asp Arg Trp Trp His Glu Cys Leu Ser Val Leu Gln Asp Ala Gly Tyr
            1140   1145   1150

Leu Glu Trp Lys Asp Asp Ser Val Ala Ala Ala Gln Ala Leu Glu Ser
10   1155   1160   1165

Glu Ser Gln Glu Ala Trp Trp Ser Arg Trp Asn Thr Glu Tyr Lys His
        1170   1175   1180

15Tyr Gln Asn Asp Pro Glu Lys Lys Thr Leu Ala Ile Leu Ile Asn Asp
    1185   1190   1195   1200

Cys Leu Gln Ala Leu Pro Gly Val Leu Ser Gly Glu Gln Leu Ile Thr
                1205   1210   1215
20
Asp Ile Ile Phe Pro Asn Gly Ser Met Glu Lys Met Glu Gly Leu Tyr
            1220   1225   1230

Lys Asn Asn Arg Ile Ala Asp Tyr Cys Asn Gln Cys Val Gly Asp Leu
25   1235   1240   1245

Leu Val Gln Phe Ile Glu Ala Arg Leu Ser Arg Asp Ala Asn Ala Arg
        1250   1255   1260

30Ile Arg Ile Ile Glu Ile Gly Ala Gly Thr Gly Gly Thr Thr Ala Ile
    1265   1270   1275   1280

Val Leu Pro Met Leu Gln Ala Tyr Gln Asp His Ile Asp Thr Tyr Cys
                1285   1290   1295
35
Tyr Thr Asp Val Ser Lys Ala Phe Leu Met His Gly Gln Glu His Tyr
            1300   1305   1310

Gly Glu Gln Tyr Pro Tyr Leu Ser Tyr Cys Leu Cys Asn Ile Glu Gln
40   1315   1320   1325

Asp Leu Val Ala Gln Gly Ile Ser Val Gly Asp Tyr Asp Ile Ala Ile
    1330   1335   1340

Ala Ala Asn Val Leu His Ala Thr Arg Asn Ile His Glu Thr Val Ser
51345   1350   1355   1360

His Val Arg Gln Ala Leu Ala Ala Asn Gly Leu Leu Ile Leu Asn Glu
                1365   1370   1375

10Phe Ser Gln Lys Ser Val Phe Ser Ser Val Ile Phe Gly Leu Ile Asp
                1380   1385   1390

Gly Trp Ala Leu Ser Glu Asp Thr Gly Leu Arg Ile Pro Gly Ser Pro
            1395   1400   1405
15
    Gly Leu Tyr Pro Lys Gln Trp Gln Ala Val Leu Glu Ala Ser Gly Phe
        1410   1415   1420

    Gly Asp Val Glu Phe Pro Leu His Asp Ala Arg Glu Leu Gly Gln Gln
201425   1430   1435   1440

    Ile Ile Leu Ala Thr Asn Ala His Ala Asn Val Ala Ser Asp Leu Ala
                1445   1450   1455

25Thr Ser Val Ile Asp His Ala Pro Lys Arg Leu Pro Ser Ala Glu Val
            1460   1465   1470

    Ser Met Asp Glu Arg Val Ser His Asp Ala Met Met Lys Ala Ser Val
            1475   1480   1485
30
    Lys Gln Leu Leu Val Glu Gln Leu Ser Gln Ser Leu Lys Leu Asp Met
        1490   1495   1500

    Asn Glu Ile His Pro Asp Glu Ser Phe Ala Asp Tyr Gly Val Asp Ser
351505   1510   1515   1520

    Ile Thr Gly Ala Ser Phe Ile Gln Gln Leu Asn Asp Thr Leu Thr Leu
                1525   1530   1535

40Thr Leu Lys Thr Val Cys Leu Phe Asp His Ser Ser Val Asn Arg Leu

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                1540                    1545                    1550

    Thr Ala Tyr Leu Leu Ser Asp Tyr Gly Asp Asp Ile Ala Gln Trp Leu
            1555                1560                1565
 5
    Ala Thr Ala Pro Ala Leu Val Asp His Pro Gln Ser Val Val Ser Gln
        1570                1575                1580


    Val Leu Pro Glu Arg Ser Pro Ala Ser Thr Gln Ala Lys Pro Leu Pro
101585                1590                1595                1600


    Ser Val Pro Pro Ser Leu Ser Met Glu Ser Pro Val Gln Gln Glu Ser
                1605                1610                1615

15Ile Ala Ile Ile Gly Met Ser Gly Arg Phe Ala Ala Ser Glu Asn Leu
                1620                1625                1630


    Glu Ala Phe Trp Gln Gln Leu Ala Gln Gly Val Asp Leu Val Glu Pro
            1635                1640                1645
20
    Ala Ser Arg Trp Gly Pro Gln Ala Glu Thr Tyr Tyr Gly Ser Phe Leu
        1650                1655                1660


    Lys Asp Met Asp Gln Phe Asp Pro Leu Phe Phe Asn Leu Ser Gly Val
251665                1670                1675                1680


    Glu Ala Ser Tyr Met Asp Pro Gln Gln Arg Cys Phe Leu Glu Glu Ser
                1685                1690                1695


30Trp Asn Ala Leu Glu Asn Ala Gly Tyr Val Gly Asp Gly Ile Glu Gly
                1700                1705                1710


    Lys Arg Cys Gly Ile Tyr Ala Gly Cys Val Ser Gly Asp Tyr Ala Gln
            1715                1720                1725
35
    Leu Leu Gly Asp Gln Pro Pro Pro Gln Ala Phe Trp Gly Asn Ala Ser
        1730                1735                1740


    Ser Ile Ile Pro Ala Arg Ile Ala Tyr Tyr Leu Asn Leu Gln Gly Pro
401745                1750                1755                1760
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Ala Thr Ala Val Asp Thr Ala Cys Ser Ser Ser Leu Val Ala Val His
            1765   1770   1775

Leu Ala Cys Gln Ala Leu His Leu Asp Glu Met Glu Met Ala Leu Ala
5   1780   1785   1790

Gly Gly Val Ser Leu Tyr Pro Thr Pro Ile Ile Val Glx Val Phe Ala
            1795   1800   1805

10Trp Cys Arg Tyr
      1810